MIAMI-MIAMI BEACH TRANSPORTATION CORRIDOR STUDY

Draft Technical Memorandum
Concept Evaluation
And Results Report
(Task 4.5)

Prepared for:

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and the
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Prepared by:

The Corradino Group

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1. SUMMARY

The Bay Link transportation corridor study is evaluating transportation alternatives for providing a convenient link between downtown Miami and the Miami Beach Convention Center. This link would provide access to locations along the corridor in the downtown and Miami Beach. Additionally, because the downtown is the locus of other public transportation, including Metrorail, Metromover, Metrobus and jitneys, the link would provide superior access to Miami Beach from most of Miami-Dade County. Also, with a proposed extension of Metrorail to the Miami Intermodal Center (MIC), Bay Link would provide a high quality connection between the Beach and the Miami International Airport (MIA).

The subject of this Technical Memorandum is a set of ridership estimates for the transportation corridor. The primary tool for producing the ridership estimates is the Metropolitan Planning Organization's (MPO) newest travel demand forecasting model. The model uses the Florida Standard Urban Transportation Modeling Structure (FSUTMS). This structure, common to all urban areas in Florida, is tailored by the MPO specifically for Miami-Dade County. The validation year for the model is 1999, and the forecast year is 2025. This is the model that was used in the recently adopted update of the Long-Range Transportation Plan. All of the data and transportation networks in the model were developed through the MPO's transportation planning process. Thus, this ridership forecasting effort was consistent with the MPO's overall transportation planning process.

The MPO's model was developed to assess overall transportation issues for the county. It was not focused on any particular project. Details of a specific project, which can be developed only in a project study, were not included in the MPO's original model. Thus, the consultant made a few modifications to the model in order to provide better and more specific estimates for Bay Link. These modifications included: detailed coding of the proposed Bay Link service, modification of feeder bus routes to serve the line, slightly different fare assumptions, a modification to the coding of the Metrorail line as it relates to the extension to the MIC, and a modification of the connection between the MIC and the MIA terminal. Finally, because the FSUTMS is a "systems-level" model, an adjustment was made to model results to account for variations between model validation results and observed travel patterns. These types of modifications are required whenever "project-level" travel demand estimates are made using a travel demand-forecasting model.

Ridership estimates provided by the model are in the range expected. The table below presents two statistics: boardings and passenger volumes on the MacArthur Causeway. These volumes have been adjusted to account for the variation in validation as noted above.

2025 Daily Ridership Summary

Alternative	Daily Boardings	MacArthur Causeway Volume
Null	---	8,313
LRT A1B3	17,380	16,365
LRT A2B2	15,534	14,734
LRT A3B1	16,663	16,180
BRT	---	13,336

Notes: [1]Boardings not meaningful for null and BRT
[2]Boardings and volumes factored by 1.31.
Source: The Corradino Group

2. SUMMARY OF MODIFICATIONS TO THE MODEL

The beginning highway and transit networks for the Bay Link analysis were the recently adopted 2025 Long-Range transportation plan. As noted above, several changes were made to these networks for the Bay Link study. The following changes were made in all of the alternatives.

- In the LRTP Cost Feasible (CF) network there was not a high speed, direct connection between the MIC and MIA terminal. The connection was made by local bus routes in mixed traffic, requiring a bus to rail transfer at the MIC. For the Bay Link study, it was assumed that there was a connection between the MIA terminal and the MIC and downtown. To simulate this connection, a 3 minute walk connector (mode 3) was provided for the 1.5 mile distance between the MIA terminal node and the MIC Metrorail node.
- In the CF network, transfers between the Beach LRT and Metrorail and Metromover stations (Government Center) were made through the sidewalk network. In the Bay Link alternatives, it was assumed that the LRT platform and the Government Center station would be in close proximity. This connection was simulated with a one-minute model 3 walk connector.
- In the CF network, there were two Metrorail lines. The first is the existing Stage 1 Metrorail line at a 6-minute (peak) headway. The connection to the MIC was another line, between the MIC and Earlington Heights stations, at a 5-minute (peak) headway. For the Bay Link alternatives, the MIC line was reconfigured to run from the MIC, through Earlington Heights, through downtown and on to

Dadeland South at an 8-minute headway. The Stage 1 line also ran at 8 minutes. Thus, the Metrorail trunk line had an effective 4-minute headway (peak). The effective off-peak headway was 10 minutes. With this configuration, no transfers are required between the MIC and downtown (or Dadeland).

- For each of the alternatives, existing Metrobus routes were diverted to feed the LRT and BRT stations. The specific routes and stations are detailed in Parson Brinckerhoff's working paper describing the alternatives.
- The transit fare assumptions for the Bay Link alternatives are somewhat different than those in the LRTP because it includes a rail to rail transfer fee. Initial boarding fare for all rail modes is $1.25. The fare for all regular bus boardings is $1.25. Bus to rail transfers are $0.25 and rail-to-rail transfer is $0.25. Rail to Metromover is free. Metromover is $0.25 and the mover to rail transfer is $1.00. Express bus is $1.50 and transfer to rail is free.
- Parking was added to the model to reflect actual parking availability in the vicinity of stations.

	Max Drive	PARKING			Added	Added
Station	Distance	No. Spaces	All Day Cost	Mid-day Cost	P&R Time	K&R Time
Overtown	10	400+	$4	$4	3 min.	1 min.
Government Center	10	600+	$4	$4	3 min.	1 min.
All Other Downtown	N/A	N/A	N/A	N/A	N/A	N/A
Watson Island *	10	200+	8 *	$4	4 min.	1 min.
All Other Causeway	N/A	N/A	N/A	N/A	N/A	N/A
Convention Center	10	1500+	$8	$3	3 min.	1 min.
6th St. (MB)	2	700+	$14	$3	N/A	1 min.
10th St. (MB)	2	100+	$14	$3	N/A	1 min.
14th St. (MB)	2	300+	$6	$4	N/A	1 min.
Lincoln Rd. (MB)	2	700+	$14	$3	N/A	1 min.
Along 17th St. (MB)	2	300+	$6	$3	N/A	1 min.
Along Alton Rd. (MB)	2	50+	$6	$3	N/A	1 min.

The CF Plan contained a Miami Beach LRT line. For the Null alternative, the Miami Beach LRT line was removed. The changes noted above were included in the Null alternative.

Finally, the MPO's 1999 model validation was reviewed for reasonableness and adjustments that should be made to model results. Among the findings was that both transit and highway volumes on the MacArthur Causeway as estimated by the model were considerably smaller than counted volumes. Actual daily ridership counts for the transit lines totaled 8,000, while the model estimated 6,061. The ratio of counted to modeled ridership is 1.32. Similarly, the 1999 traffic count is 88,442 VPD (in the network), while the modeled volume is 67,496. The ratio of counted to modeled volume is 1.31. On the basis of this analysis, it was concluded that the model is underestimating the Beach to downtown travel movements, for both highway and transit travel. Thus, a

factor of 1.31 was be applied to the 2025 transit estimates produced by the model for lines crossing the MacArthur Causeway.

3. REASONABLENESS CHECKS

While the consultant was confident of the modeling process used to make the ridership estimates for the Bay Link study, it is standard practice to compare results of the analysis to other similar model runs. Thus, the consultant compared several statistics.

The consultant compared the mode choice results from the various model runs, in terms of daily linked trips. The table displayed below shows that the model runs are consistent in terms of the number of trips for each mode and purpose for each alternative.

MODE CHOICE SUMMARY
DAILY PERSON TRIPS (Linked)

		ALTERNATIVE						
		A1B3	**A2B2**	**A3B1**	**BRT**	**Null**	**99 Valid.**	**25 LRTP**
HBW								
	Auto	2,255,241	2,255,423	2,255,425	2,254,237	2,254,815	1,672,905	2,259,099
	Transit	124,887	124,704	124,702	125,890	125,312	88,302	121,028
	Total	2,380,127	2,380,127	2,380,127	2,380,127	2,380,127	1,761,207	2,380,127
HBNW								
	Auto	4,450,159	4,450,246	4,450,065	4,452,141	4,452,198	3,419,088	4,459,093
	Transit	111,553	111,466	111,647	109,572	109,514	71,233	102,619
	Total	4,561,712	4,561,712	4,561,712	4,561,712	4,561,712	3,490,321	4,561,712
NHB								
	Auto	2,604,324	2,604,308	2,604,409	2,605,975	2,606,961	1,898,767	2,610,478
	Transit	57,707	57,722	57,621	56,055	55,069	34,013	51,552
	Total	2,662,030	2,662,030	2,662,030	2,662,030	2,662,030	1,932,780	2,662,030
TOTAL								
	Auto	9,309,723	9,309,977	9,309,899	9,312,352	9,313,973	6,990,760	9,328,670
	Transit	294,146	293,893	293,970	291,517	289,896	193,548	275,199
	Total	9,603,869	9,603,869	9,603,869	9,603,869	9,603,869	7,184,308	9,603,869

Note: Unfactored
Source: The Corradino Group

Boardings by transit mode also were examined, as shown in the table below. These statistics show the expected variation by alternatives.

BOARDINGS BY MODE
UNLINKED TRIPS

	ALTERNATIVE						
	A1B3	**A2B2**	**A3B1**	**BRT**	**Null**	**99 Valid.**	**25 LRTP**
Beach LRT	17,375	15,632	15,445	NA	NA	NA	12,232
Metrorail	70,806	71,188	71,593	70,794	70,389	48,100	75,239
Metromover	28,207	30,124	27,216	19,091	21,515	19,200	18,839
All Transit	448,200	448,164	446,175	439,702	444,203	281,300	409,538

Source: The Corradino Group

The consultant also reviewed the model's ZDATA3A files to verify that appropriate special generators were included in the model. Appendix A presents the ZDATA3A file. Special generators were included for South Beach attractions, the Seaquarium, the Miami Beach Convention Center and the Miami International Airport, among other locations.

Several other statistics were extracted from the model as a way to assess whether the alternatives were attracting a reasonable fraction of the available travel market. As noted in the introduction, the LRT alternatives are expected to attract roughly 15,000 daily boardings. In comparison, the model estimated for 2025 (daily persons):

- 26,314 trips between the Miami CBD and South Beach.
- 3,107 trips between MIA and South Beach.
- 6,394 trips between MIA and the Miami CBD.

Thus, the model estimates that the proposed LRT alternatives would capture a reasonably large share of the travel market.

4. ALTERNATIVES

The consultant applied the Miami-Dade FSUTMS model for the following conditions:

- 1999 Validation – To confirm the validation run and make statistics available to the analysis.
- 2025 Cost Feasible LRTP – To provide all LRTP output to the analysis.
- 2025 Null – The LRTP run with the Miami Beach LRT line removed.
- 2025 A1B3 – A single line. A "hook" in the downtown, and using Alton Road on Miami Beach (Figure 1).
- 2025 A2B2 – The alternative is coded as three lines. It provides a loop in downtown Miami, and provides service to Washington Avenue and Alton Road on the Beach (Figure 2).
- 2025 A3B1 – This alternative is coded as two lines, and provides a loop in the Downtown and service to Washington Avenue on the Beach (Figure 3).

- 2025 BRT – In this alternative bus service was enhanced through the downtown and along the Beach. Special bus lanes would be provided along Biscayne Boulevard, and along the causeway beginning at the eastern end of Watson Island and ending at the intersection of Fifth Street and Alton Road.

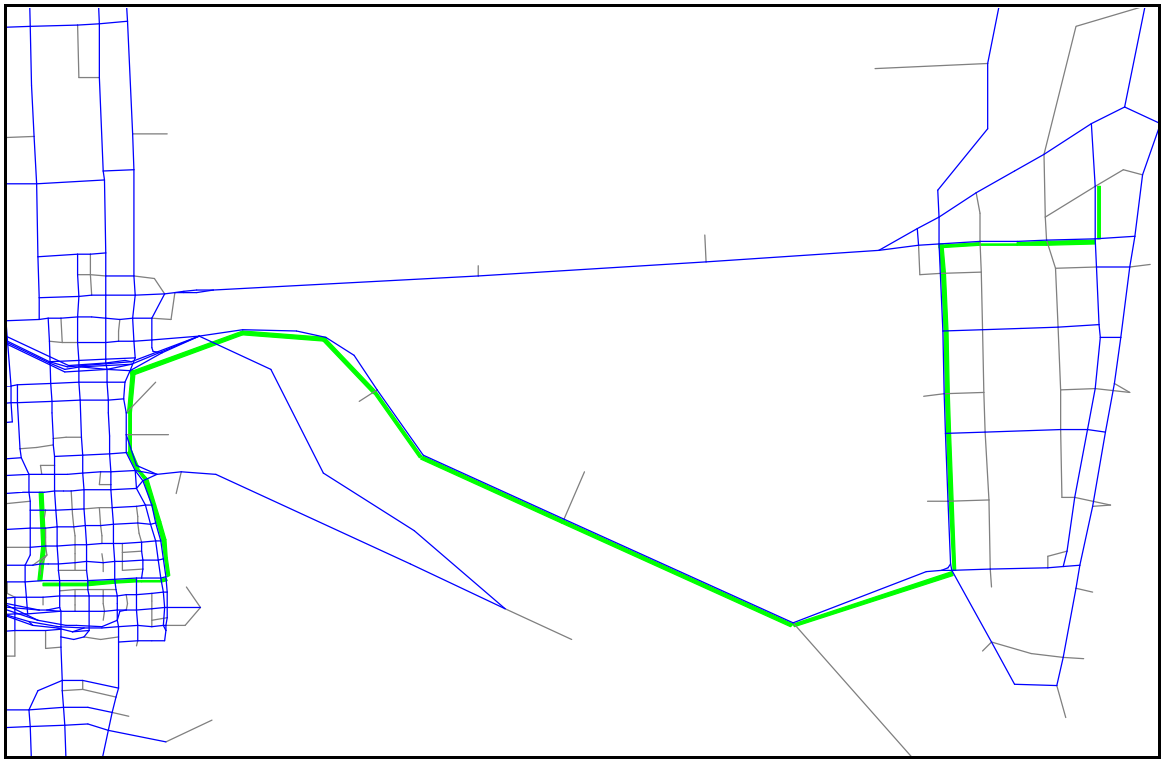

Figure 1 – Alternative A1 B3

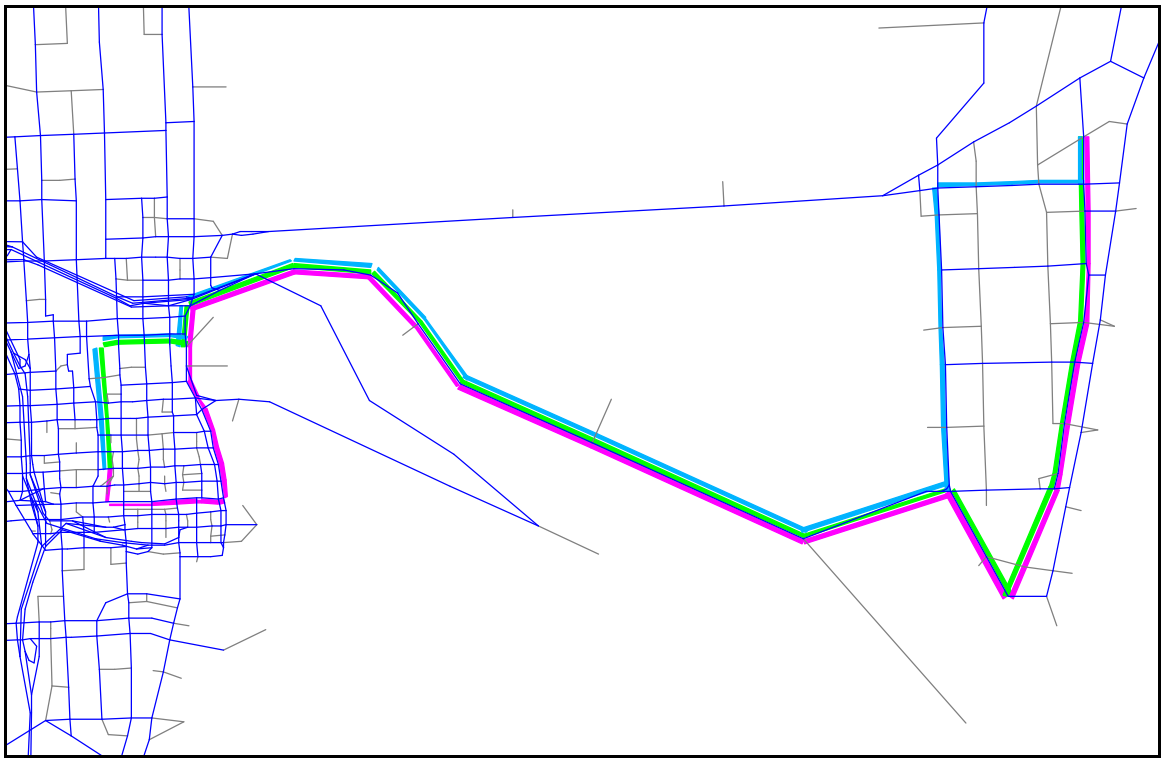

Figure 2 - Alternative A2 B2

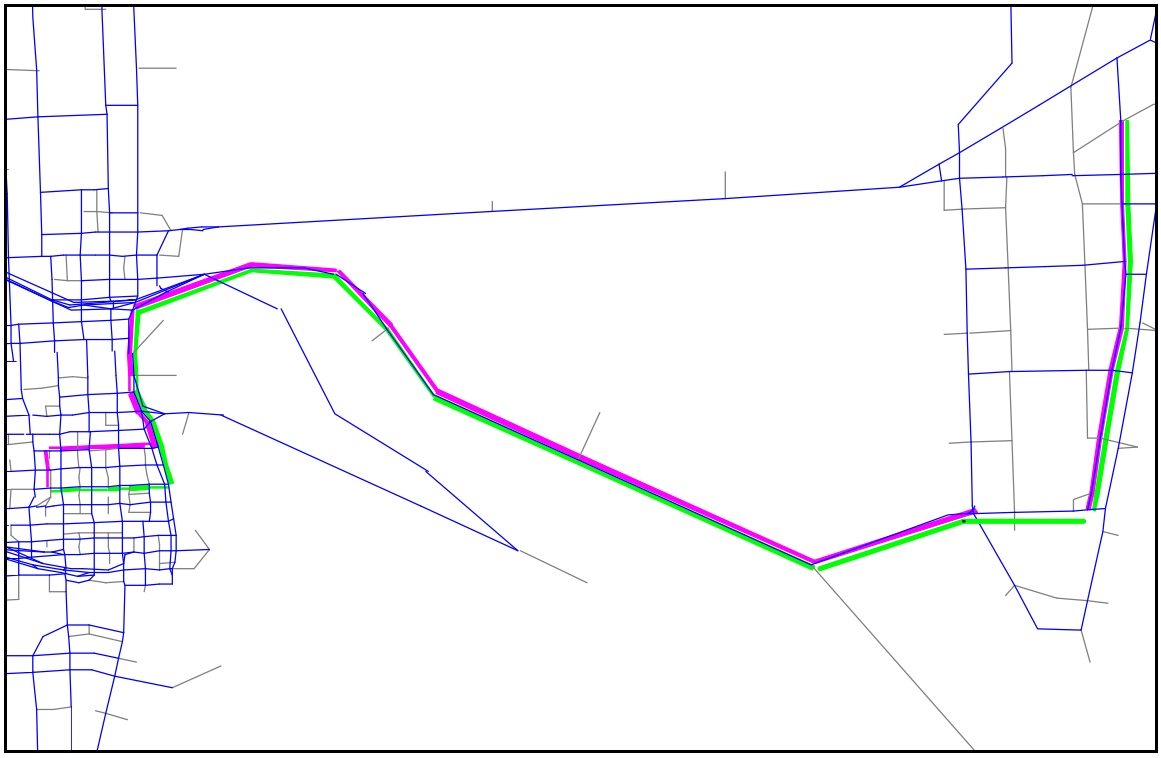

Figure 3 - Alternative A3 B2

All alternatives provide an effective headway of five minutes during the peak period, and fifteen minutes during the off peak. As noted earlier, for each alternative nearby Metrobus routes are diverted through the LRT and BRT stations. Competing service across the MacArthur Causeway was either dropped, or lines were turned back in the downtown or at the Miami Beach Convention Center.

5. RIDERSHIP

Expected daily boardings and passenger volumes across the MacArthur Causeway for 2025 are presented below. These estimates have been factored by 1.31 to account for the differences between the counts and model volume along the MacArthur Causeway in the 1999 validation.

2025 Daily Ridership Summary

Alternative	Daily Boardings	MacArthur Causeway Volume
Null	---	8,313
LRT A1B3	17,380	16,365
LRT A2B2	15,534	14,734
LRT A3B1	16,663	16,180
BRT	---	13,336

Notes: [1]Boardings not meaningful for null and BRT
[2]Boardings and volumes factored by 1.31.

Source: The Corradino Group

The model also reports estimates of station activity. Summaries for the three LRT alternatives follow.

DAILY STATION ON-OFF DATA - A1B3

STATION	NODE	ON	OFF	LOAD
Route 101				
Overtown LRT	9761	231	231	461
Government Ctr. LRT	5263	2,050	2,050	4,561
Miami Av LRT	5276	634	634	5,823
2nd Av LRT	5308	808	808	7,422
Bayfront LRT	5327	253	253	7,927
Bayside LRT	5323	333	333	8,590
Arena LRT	5319	148	148	8,886
Bicentennial Park LRT	5071	430	430	9,699
Watson Island LRT	2004	25	25	9,736
Palm Island LRT	2007	24	24	9,697
Fisher Island LRT	2008	41	41	9,745
MB 5th St LRT	2011	921	921	8,026
MB 8TH St LRT	2022	528	528	7,593
MB 11th St LRT	2026	803	803	6,246
MB 15th St. LRT	2036	503	503	5,245
MB 17th St LRT	2051	245	245	5,016
MB Meridian Av LRT	2053	286	286	4,484
MB Perf Arts Ctr LRT	2057	1,128	1,128	2,228
MB Conv. Center	2056	1,115	1,115	-

Note: Factored by 1.31

Source: The Corradino Group

DAILY STATION ON-OFF DATA - A2B2

STATION	NODE	DAILY ON	DAILY OFF	DAILY LOAD
Route 100				
MB Conv. Center	2056	12	12	-
MB Lincoln Rd. E. LRT	2041	417	417	22
MB 14th St LRT	2038	-	-	854
MB 10th St LRT	2028	190	190	854
MB 6th St LRT	7171	324	324	1,231
MB 1st St LRT	2013	162	162	1,859
MB 5th St LRT	2011	339	339	2,122
Fisher Island LRT	2008	13	13	2,794
Palm Island LRT	2007	9	9	2,785
Watson Island LRT	2004	7	7	2,802
Bicentennial Park LRT	5071	85	85	2,790
Park West LRT	9763	55	55	2,625
9th St LRT	9764	45	45	2,526
Overtown LRT	9761	219	219	2,488
Government Ctr. LRT	5263	1,115	1,115	2,228
Route 101				
Government Ctr. LRT	5263	1,586	1,586	-
Miami Av LRT	5276	398	398	3,172
2nd Av LRT	5308	254	254	3,967
Bayfront LRT	5327	9	9	4,399
Bayside LRT	5323	155	155	4,417
Arena LRT	5319	825	825	4,624
Bicentennial Park LRT	5071	331	331	6,270
Watson Island LRT	2004	59	59	6,633
Palm Island LRT	2007	13	13	6,517
Fisher Island LRT	2008	77	77	6,519
MB 5th St LRT	2011	559	559	6,398
MB 1st St LRT	2013	959	959	5,401
MB 6th St LRT	7171	438	438	3,580
MB 10th St LRT	2028	295	295	3,236
MB 14th St LRT	2038	18	18	2,923
MB Lincoln Rd. E. LRT	2041	790	790	2,958
MB Conv. Center	2056	693	693	1,386
Route 102				
MB Conv. Center	2056	483	483	-
MB Perf Arts Ctr LRT	2057	274	274	965
MB Meridian Av LRT	2053	119	119	1,513
MB 17th St LRT	2051	176	176	1,749
MB 15th St. LRT	2036	424	424	1,956
MB 11th St LRT	2026	483	483	2,803
MB 8TH St LRT	2022	255	255	3,713

MB 5th St LRT	2011	368	368	4,002
Fisher Island LRT	2008	22	22	4,692
Palm Island LRT	2007	14	14	4,668
Watson Island LRT	2004	14	14	4,692
Bicentennial Park LRT	5071	227	227	4,675
Park West LRT	9763	113	113	4,227
9th St LRT	9764	71	71	4,013
Overtown LRT	9761	424	424	3,930
Government Ctr. LRT	5263	1,631	1,631	3,262

Note: Factored by 1.31
Source: The Corradino Group

DAILY STATION ON-OFF DATA - A3B1

STATION	NODE	DAILY ON	DAILY OFF	DAILY LOAD
Route 101				
Government Ctr. LRT	5263	1,989	1,989	-
Miami Av LRT	5272	417	417	3,976
2nd Av LRT	5306	197	197	4,809
Bayside LRT	5323	33	33	5,050
Arena LRT	5319	72	72	5,032
Bicentennial Park LRT	5071	385	385	5,176
Watson Island LRT	2004	66	66	5,609
Palm Island LRT	2007	12	12	5,499
Fisher Island LRT	2008	63	63	5,506
MB 5th St LRT	2011	466	466	5,412
MB 6th St LRT	7171	371	371	3,136
MB 10th St LRT	2028	232	232	2,874
MB 14th St LRT	2038	20	20	2,569
MB Lincoln Rd. E. LRT	2041	706	706	2,607
MB Conv. Center	2056	603	603	1,204
Route 104				
MB Conv. Center	2056	1,112	1,112	-
MB Lincoln Rd. E. LRT	2041	1,543	1,543	2,224
MB 14th St LRT	2038	107	107	5,308
MB 10th St LRT	2028	291	291	5,523
MB 6th St LRT	7171	985	985	6,046
MB 5th St LRT	2011	820	820	8,374
Fisher Island LRT	2008	45	45	9,749
Palm Island LRT	2007	24	24	9,693
Watson Island LRT	2004	18	18	9,733
Bicentennial Park LRT	5071	377	377	9,707
Arena LRT	5319	255	255	8,983
College LRT	5303	1,398	1,398	8,473
Federal LRT	5270	121	121	5,678
Government Ctr. LRT	5263	2,720	2,720	5,438

Note: Factored by 1.31

Source: The Corradino Group

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APPENDIX A
ZDATA3A – SPECIAL GENERATORS

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3 21 273A+  9800      100                                  AMELIA EARHART PARK
3 37 511A+  1000      100                                  BICENTENIAL PARK
3 38 520A+ 13300      100                                  MIAMI ARENA
3 37 521AT 34017 60    20       20                        PORT OF MIAMI
3 37 540A+  2400      100                                  BAYFRONT PARK
3  5 596A+  5000      100                                  HAULOVER BEACH
3  2 620A+  5900       88     7     5                      MIAMI BEACH CONV CENTER
3  2 642A+  5100      100                                  SOUTH BEACH
3  2 643A+  9800      100                                  SOUTH BEACH POINTE
3  1 645A+  8800      100                                  MIAMI SEAQUARIUM
3  1 646A+ 12300      100                                  CRANDON PARK
3  1 649A+  1200      100                                  CAPE FLORIDA ST PARK
3 11 653A+ 10300 50              50                       PENSUCO/MEDLEY AREA
3 42 743A+ 68066             50    50                     MIA -TERMINAL & SE AREA
3 51 769A+  3700      100                                  MEL REESE/GRAPELAND PK
3 701207A+ 24600      100                                  METROZOO
3 881359A+  2400      100                                  BISCAYNE NAT'L PARK
3 831435A+  6100      100                                  EVERGLADES NAT'L PARK
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